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The Effect of Financial Structure on Crises: Universal Banking in Interwar Europe

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Abstract

This paper examines the link between banking structure and financial fragility across Europe during the 1920s and 1930s using a new database. Monthly and annual data are analyzed to show that countries with universal banking were more likely to experience crises. Furthermore, those countries with universal banking, which have a crisis, are shown to experience a slowdown in their economic growth.

Key Words: Great Depression, Banking Crisis, Real Effects of Crises, Universal Banking

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1 Introduction

A lot of parallels have been drawn between the recent global crisis and the Great Depression and lessons from the policy mistakes from the Great Depression have been taken into consideration in the response to the current crisis. For example, interest rates were lowered quickly and drastically, and international organizations encouraged non-protectionism and international cooperation.

Another link between the recent crisis and the Great Depression has been pointed out by Eichengreen (2008). According to Eichengreen, the deregulation of commissions for stock trading in the 1970s and the repeal of the Glass-Steagall, which separated commercial and investment banking, in 1999 unintentionally created a regulation vacuum that contributed to the crisis. With the deregulations, brokers like Charles-Schwab began competing with investment banks who traditionally booked stock trades for their customers. The repeal of Glass-Steagall allowed commercial banks and insurance companies like AIG to encroach the traditional activities of investment banks. Both of these changes led investment banks to get into new lines of business such as complex derivative securities as well as use more leverage to sustain profitability.

Under normal circumstances, universal banking (mixing commercial and investment banking) creates a better system of collecting and using information, an important factor in banking, and reduces uncertainty and risk as universal banks diversify by spreading over a great range of clients and geographic locations.[1] This protects banks from large losses in the face of a local or a sectoral business downturn, but when a general economic shock such as the Great Depression hits the economy, they can be much more vulnerable. As a result of this experience in the 1930s, the Glass-Steagall Act was passed to prevent such weaknesses in the banking system. However, many countries have abolished regulations limiting the range

[1] Calomiris (1995) focuses on how universal banks are able to lower information costs.

of activities in which their banks can engage in recent years. One rationale for such regulatory changes is that allowing financial institutions to engage in universal banking allows them the diversification of assets and liabilities needed to withstand shocks to the economy.

This study aims to push forward the literature on the connections between bank structure and stability by asking whether this historical experience constitutes an exception, or whether it suggests that the connections between bank structure and stability are more complex and contingent than other recent analyses suggest. The question of interest is whether some kinds of financial structures, in particular those with universal banking, were particularly vulnerable during one of the most turbulent times of the twentieth century. To do so, we study European countries in the interwar era when financial crises were common and some countries had universal banking.

Given the close relationship between industry and banks in most of continental Europe, the role of universal banking deserves special attention. [2] Traditionally, it has been believed that such industrial banking allows banks to have considerable influence over firms through voting powers and representation on supervisory boards.[3] Despite their early influence in the industrialization of many countries at the end of the nineteenth century, in the interwar years, universal banks suffered both direct and indirect losses due to their industrial ties and countries with universal banks were destabilized by major banking crises.[4]

The European experience in the 1930s, when crises were common to many countries, can be analyzed to draw inferences about recent events, especially about how financial markets operate, by answering questions such as: Which countries experience financial crises? What determines the severity of these crises? In interwar Europe, the basic determinants of having a crisis were being on the gold standard, previous inflationary experience in the 1920s, the

[2]See Gerschenkron (1962), Schumpeter (1939), Whale (1930), and Chandler (1990) for the analysis of the role of banks in promoting industrial growth.

[3]Fohlin (1994) suggests that the role of universal banking in promoting growth in Germany was not as important as once thought by analyzing the links between banks and industry through supervisory boards.

[4]This double effect was one of the factors that caused the Credit Anstalt crisis.

level of reserves of the central bank (as this was important in determining whether it could act as a lender of last resort) and the structure of the banking system.[5]

This paper focuses on this last factor, by using a new database of 13 European countries in the interwar period. The relationship between banking structure and banking stability in this period has been analyzed in several cross-country studies. Bernanke and James (1991) find that unit banking as in the United States and universal banking as in Germany and Austria, dependence on short term foreign liabilities, and past hyperinflation experience made countries more vulnerable to a full scale banking crisis. Grossman (1994) shows that branching, concentrated banking, and large bank size brought more stability to a banking system. Good macroeconomic indicators also added to the health of the banking system by decreasing exchange rate uncertainty, and the ratio of non-performing loans.[6]

Given differences across countries in terms of banking structure and the severity of the depression, it is important to analyze this link between financial instability and universal banking, which has been the topic of several studies. Francke and Hudson (1984) claim that universal banks' close relations to industry make them more susceptible to a crisis, and the spillover of this effect to the whole banking system is inevitable. White (1986), on the other hand, shows that for the case of the United States, bank involvement in securities activities actually stabilizes an economy in times of crisis. Saunders and Walter (1994) also show that the activities universal banks are involved in are not riskier than ordinary commercial bank activities. Kroszner and Rajan (1994) show that in the period before the Glass-Steagall Act, U.S. universal banks neither abused their power into fooling the public into purchasing low quality securities nor performed worse than other types of financial institutions in the securities market.

[5]According to Eichengreen and Sachs (1985), countries that abandoned the gold standard recovered from the Great Depression whereas those countries that stayed on suffered in terms of output and unemployment.

[6]Jonker and Zanden (1995) also analyze twelve European countries in the interwar era and find that the inflationary experience in the early 1920s was positively associated with banking instability in the second half of the 1920s.

To analyze whether having a universal type of banking system increases the probability of having a banking crisis, logit regressions are estimated where the dependent variable is having a banking crisis in a given year. Universal banking is shown to increase the probability of having a banking crisis. Results also reconfirm the common point in the literature that being on the gold standard prevented central banks from injecting liquidity to their banking systems in need of capital and thus led to a more severe depression. Other determinants of banking crises are also analyzed.[7] Having branching and capital controls decrease the probability of crisis, whereas openness to trade and low reserves increase the probability of crisis.

Next, the relationship between output performance and having this type of banking structure is considered. The link between financial development and economic growth has been the topic of a debate. On one hand, financial development is thought to have growth enhancing effects.[8] On the other hand, financial crises usually lead to recessions.[9] Loayza and Rancière (2006) find that there is a positive long-run and negative short-run relationship between financial intermediation and output growth. Some recent empirical studies conclude that banking crises lead to a decline in economic growth.[10] Gupta, Mishra and Sahay (2003) show that currency crises lead to a contraction in output 60% of the time. To address this issue, output growth is regressed on macroeconomic and banking system variables, including a universal banking dummy. Openness to trade, having high reserves, universal banking and a branching network all improve output performance. An increase in the change in the discount rate, having a peg and capital controls decrease output growth. It is shown

[7]See Demirgüç-Kunt and Detragiache (1998) and Sachs, Tornell and Velasco (1996) for an analysis of recent periods.

[8]See King and Levine (1993), Levine, Loayza and Beck (2000).

[9]See Gourinchas, Landerretche and Valdés (2001), Kaminsky and Reinhart (1999), Gaytan and Rancière (2003) and Demirgüç-Kunt and Degatriache (2000).

[10]Contraction after a crisis is larger when the surge of private capital flows is bigger, the capital and current accounts are more liberalized, the pre-crisis business cycle boom is more pronounced and the monetary policy response is tighter. See Dell'Ariccia, Detragiache and Rajan (2005), Hutchison and Noy (2005), McDill (2000), Demirgüç-Kunt, Detragiache and Gupta (2006) and Boyd, Kwak and Smith (2005).

that although having universal banking is not detrimental to output growth by itself, those countries with universal banking, which have a crisis experience a slowdown in their economic growth.[11]

The paper is organized as follows. Section 2 gives some background information about the banking systems in different European countries in the interwar period. Section 3 presents cross-country evidence on the relationship between universal banks and banking crises. Section 4 provides some final remarks.

2 Banking Regulation in Interwar Europe

The financial history of interwar Europe is full of major banking crises and institutional responses to this. This section discusses the differences in the financial systems and banking regulations of European countries. This will help in understanding the relative importance of these factors that affected the severity of the depression in each country.

During this period, European countries were at different stages in the development of their financial systems.According to Goldsmith (1969), financial intermediation ratios in 1929 were 65% for Greece, 85% for Belgium, 95% for Italy, 131% for Great Britain, 138% for Sweden, 186% for Denmark and 241% for Norway. Despite these differences, most countries suffered banking crises and had to restructure their financial systems through state intervention and to increase regulation such as restriction of activities, auditing, and limitation of equity holdings and credits in relation to size. Table 1 gives the dates of the banking laws passed after the Great Depression. Legislation regulating the activities of commercial banks was an exception in the prewar period and not so common in the first decade after the war. Laws were passed in the new European states after 1919 and in Denmark and Norway after the post-war crises. During the currency stabilization, banking regulations were imposed in

[11]One explanation for this could be the the claim that bank based financial systems lead to more rapid economic growth than market based ones. See Levine (2002).

Spain and Portugal. After the financial crisis of 1931, many European countries, especially Germany, Belgium and Switzerland revised their banking regulations. This is a big indicator of how banks were perceived as part of the problem causing the Great Depression.

These laws addressed three fundamental issues of the postwar period that led to banking crises in many countries: the increase in the size of banks; the subsequent deepening of relations between commerce and industry, undesirability of mixed banking; and the lack of control the central banks had over commercial banks. The different laws passed in different countries are presented in Table 2.

Most importantly, regulators were influenced by the post-war tendency of banks to have low capital to assets ratio, thus low solvency. To address this vulnerability, either minimum capital requirements were introduced or ratios between own funds and public liabilities were established.Some countries went further and established rules for minimum proportion of yearly net profits to be carried to reserves and maximum compulsory limit of ratio of reserves to share capital. This minimum was 20% for Norway, 15% for Sweden and Finland, 10% for Italy and 5% for Switzerland. Low liquidity of banks was addressed through the establishment of minimum ratios of cash to assets and detailed regulation of long-term credits and loans.[12] Another restriction was put on long-term banking transactions to achieve four objectives: "to spread risk, to diffuse credit more widely in the national economy, to prevent industrial and commercial enterprises from being controlled by banks and *vice versa*, and to separate deposit from mixed banking."[13] These goals were achieved by establishing a maximum ratio between own funds and total credits to a single debtor.Finland and Sweden had no precise rules besides the general warning about the dangers of one single debtor on the liquidity of the banks. German and Italian laws required banks to examine the books of an individual debtor before giving large credits. Furthermore, there were restrictions on

[12]Liquidity reserves are compulsory reserves of assets which are discountable at the central banks and which usually consist of short-term paper and securities issued by the State and public credit institutions.

[13]League of Nations, Money and Banking, 1937.

bank participations to separate deposit banking from industrial banking. The most radical separation was in Belgium, where banks were not allowed to hold shares or participate in enterprises other than banks with the Decrees of 1934. In Sweden, direct or indirect participations in industrial enterprises was forbidden in 1933.[14] Finally, the publication of monthly, quarterly and annual accounts in a uniform and standard fashion became the norm.

Differences in financial structures and banking regulations led to different experiences across Europe in the 1920s and 1930s. Austria and Germany had hyperinflation in the 1920s and are the most known examples of countries with universal banking, major banking crises and the most severe depressions. Belgium and France are examples of countries with moderate universal banking, which experienced moderate inflation and stayed on the gold standard until late 1936. Czechoslovakia avoided hyperinflation and did not have universal banking. Netherlands and Sweden had low inflation in the 1920s, and had banking crises in the early 1920s that made them escape the financial turmoil of the 1930s. Between 1920 and 1923, Denmark, Netherlands and Sweden experienced a decrease in their price levels by 21, 23 and 27%, respectively, and put pressure on their banking systems. From 1920 and 1932, 35 banks were liquidated in Denmark, 14 banks failed in Sweden between 1920 and 1925, and 59 banks were hit by the crisis in the Netherlands. These early banking problems shielded these three countries from trouble in the 1930s as Denmark and Sweden escaped by devaluing early and the Netherlands by acting as a safe haven for foreign capital. Although individual banks experienced trouble and collapsed, the entire banking system was never threatened. Poland did not have universal banking, but still had a severe depression. Spain was never on the gold standard and escaped the depression.

[14]The earlier law of 1911 allowed 10%.

3 The Link Between Financial Crises and Financial Structures

3.1 Data and Methodology

In order to analyze these different experiences, this section analyzes 13 European countries: Austria, Belgium, Czechoslovakia, France, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Spain, Sweden and the United Kingdom. Two data sets are utilized. First, there are monthly data from January 1920 to December 1936, which were constructed using the International Abstract of Economic Statistics, 1919-1930, and 1931-1937. Second, annual data for these countries plus eight additional ones were collected from 1924 to 1938 from the League of Nations Publications, including the Statistical Yearbooks, and Monthly Bulletins.[15] The main variables in the data set are industrial production, price indices, unemployment, central bank discount rates, deposits of the banking system, imports and exports, public finances, exchange rates, and stock market indices.

As the dependent variable, a banking crisis dummy is defined using primary and secondary sources as well as the previous literature on European banking crises. When monthly data are used, the beginning is taken as the first sign of the banking problem. According to this, Austria, Belgium, Estonia, France, Germany, Hungary, Italy, Latvia, Norway, Poland, Romania, and Switzerland experienced crises, whereas Czechoslovakia, Denmark, Finland, Greece, the Netherlands, Portugal, Sweden, Spain and the United Kingdom did not.

Despite the common shock of the Great Depression, banking systems have fared differently across countries and these differences have been attributed to several factors in the literature. Several variables are included in the empirical analysis to control for these factors.

First, being on the gold standard is an important element in determining the severity of the crisis. Central banks chose to increase their interest rates to keep foreign reserves

[15] Additional countries are Denmark, Estonia, Finland, Greece, Latvia, Portugal, Romania and Switzerland.

and stay on the gold standard instead of injecting liquidity to help their banking systems. Furthermore, Eichengreen and Sachs (1985) show that countries that left the gold standard recovered faster from the depression. In order to control for this effect, several variables are considered. The most simple ones are a dummy variable for having a peg, and a variable that equals to the number of months in a given year the country is on the gold standard. A country with a flexible exchange rate is thought to be able to better accommodate external shocks, so both of these variables are expected to increase the probability of having a banking crisis and decrease output performance. Summary statistics in Table 3 show that countries with fixed exchange rate regimes and a higher number of months on the gold standard are more likely to have a banking crisis.

The change in the official discount rate is also considered as an explanatory variable and is expected to increase the probability of crisis and decrease output growth. When a country is trying to defend its peg, the amount of foreign reserves it has plays a large role in determining whether it is successful. So, variables for the amount of foreign reserves and money to reserves ratio are also included in the analysis. The higher the reserves are, the lower the probability of crisis because the central bank has more room to use discount policy. None of these variables have different means for crisis and non-crisis cases. However, foreign liability coverage, defined as foreign currency reserves to back up foreign currency liabilities, protects a country from a crisis.

Second, current and capital account convertibility are controlled for. A dummy variable is used for capital controls, and an openness to trade measure defined as the ratio of imports plus exports to GDP is also included. Openness to trade is expected to increase output performance and decrease the probability of crisis. Although recent literature suggests that capital controls are detrimental to growth, interwar conditions, such as the volatility of short-term foreign capital, suggest that countries that imposed capital controls protected their banking systems, so the expected sign for this variable is negative. Table 3 shows that

non-crisis countries are more likely to have capital controls, although the means are not statistically different.

Macroeconomic variables such as employment and real GDP growth are included to control for the real effects of the shock of the Great Depression. One would expect crises to occur more frequently in times of macroeconomic downturns. Prices are also included to control for the effects of inflation in the 1920s and deflation in the 1930s. Countries without banking crises have lower number of bankruptcies and unemployment; and higher number of newly founded firms, stock market index and industrial production compared to countries that experience a banking crisis. These results indicate that there is a correlation between having a banking crisis and a more severe macroeconomic downturn.

Financial-system related variables are also considered to analyze the effects of the banking structure on the probability of the crisis. Specifically, dummies for having mainly universal banks and branching, deposits of commercial and savings banks in the system, cash ratios of the banking system, loans to industry and discounts are considered. Table 3 shows that crisis countries are more likely to have universal banking. Finally, if a country underwent banking reform in the 1920s, they were less likely to have a crisis. Sweden and Netherlands are examples of this. Since they reformed their banking regulations after their crises, they did not suffer as much during the 1930s. Summary statistics give only unconditional findings, so next regressions are run, conditioning on all the information.

3.2 Empirical Results

3.2.1 Logit Regressions: Probability of Banking Crises

This section seeks to answer two main questions: Does having a universal type of banking system increase the probability of having a banking crisis? What is the link between output performance and having this type of banking structure?

To address the first question, logit regressions are used. The dependent variable is 1 if

there is a banking crisis and 0 otherwise. The end date is determined according to events such as the declaration of a banking holiday and heavy state interventions in the banking system. If there are no certain events to determine the end of the crisis, one year after the peak of the crisis is used.[16]

First, the monthly data are analyzed in detail. The results are presented in Table 4. The coefficients and marginal effects, calculated at mean values of the regressors, are reported. The direction of the effect of the variables on the probability of failure can be inferred from the signs of the coefficients of the estimates. For example, a positive sign indicates an increase in the probability of failure. However, the magnitude of the effect of the variables on the likelihood of failure is determined by their marginal effects. The marginal effect of a variable measures the change in terms of probability points, caused by a change in one unit of the regressor from its mean. All the explanatory variables are lagged one period.

Most importantly, the universal dummy is positive and significant across specifications, i.e., having universal banking increases the probability of having a banking crisis. So, countries with banking systems closely related to industry were more likely to experience banking crises, which added to the severity of the depression. The marginal effect on crises for the universal dummy is 0.159 probability points. This is the largest impact compared to the other variables and suggests that having universal banking increased the probability of a banking crisis by 15%.

The change in the level of the central bank discount rate increases the probability of the crisis. A one percent increase in this variable increases the probability of crisis by 16 basis points. This reinforces the fact that being on the gold standard hurt countries as they increased interest rates to prevent gold outflows and were unable to help their banking systems.

Specification (2) adds two variables to test for the importance of being on the gold

[16]This follows Bernanke and James (1991).

standard. If the amount of foreign reserves is high, the probability of a crisis is lower. Given the likelihood of foreign capital reversals and the desire to stay on the gold standard, having foreign reserves gave central banks much more flexibility and helped prevent banking crises. In addition, banks went to the central banks to discount their bills. If the central bank acted as a lender of last resort and fulfilled this duty, then the probability of a banking crisis would have been lower.

In specifications (1) and (2), having more bankruptcies increases the probability of banking crises. Bankruptcies are important because the inability of firms to repay their loans worsened bank balance sheets, and made them unable to extend further loans. A one percent increase in bankruptcies increases the probability of crisis by 0.01 basis points.

In order to analyze the link between universal banking and crises further, in specification (3) of Table 4, the universal dummy is interacted with bankruptcy. The close ties of banks to industry have been criticized as a vulnerability of universal banks. One reason universal banks were hit more during the Great Depression was that not only banks lent to industries, but also they held stocks of these companies. The bankruptcy variable is no longer significant, while the interaction term is significant and positive, increasing the probability of a crisis.

Next, the annual data between 1919 and 1936 are used to run similar logit regressions.[17] Annual data are considered for several reasons. First, using these data increases the number of countries analyzed. Second, it enables me to analyze additional variables such as branching, openness to trade and central bank independence. Most importantly, the consequences of having a crisis in terms of output are analyzed as a welfare measure.

The results are presented in Table 5. Given the smaller sample size, not all the variables are significant, but the main results still hold. Most importantly, branching decreases the probability of crisis. Allowing branching networks decreases the probability of having a banking crisis by 12%. This is in line with the large literature concerning the effect of

[17]See the Appendix for the list of countries.

branch banking on the likelihood of a bank surviving in the face of a banking crisis. Bordo (1985) and Grossman (1994) find that countries with branch banks experience fewer crises. Likewise, Wheelock (1992) and Mitchener (forthcoming) conclude that the U.S. states that allowed branch banking had lower rates of bank failures.

Another result is that countries with independent central banks are less likely to experience crises. It makes sense that central banks that were not forced to finance government debt fared better, given the large role played by fiscal debt in interwar crises. The marginal effects associated with this variable is 0.1 basis points.

Capital controls decrease the probability of failure. As expected, given the volatility of capital flows in the interwar period, capital controls were a way to decrease the vulnerability of the economy to external fluctuations. Having a peg and changes in the discount rate increase the probability of crisis, while having reserves decreases it.[18]

3.2.2 OLS Regressions: Output Response to Banking Crises

To examine the effects of these banking crises on output, ordinary least squares regressions are run using real GDP growth as the dependent variable. Results are presented in Table 6. All the explanatory variables are lagged one period.

Given the relationship between staying on the gold standard and bad output performance, several variables are included to control for this. Having a peg decreases output growth, but insignificant. Two other variables are included to control for the effects of being on a fixed exchange rate regime. An increase in the discount rate, used as a tool to keep the peg, decreases output growth. Having foreign reserves, on the other hand, improves output performance. The result on reserves points out the importance of having the ability and flexibility to stay on the gold standard.

[18] As a robustness check, the logit regressions in Tables 4 and 5 were repeated by excluding the most traditional cases of countries with universal banking and banking crises, namely Germany and Austria, and the results still hold.

Openness to trade, having an independent central and a branching network all improve output performance. Capital controls decrease output growth. Most importantly, having universal banking improves output performance. This is interesting because the previous section shows that having universal banking increases the probability of a banking crisis and the recent literature suggests that there is an output loss associated with banking crises. The positive relation between universal banking and output shows that although countries with universal banking were more likely to experience a banking crises, the decrease in their output was not necessarily larger.

Given this last result, the link between universal banking, crises and output growth is explored further by including an interaction term between the crisis and universal dummies. The results are presented in Table 7. Universal banking is still positively associated with output growth, whereas having a crisis is associated with slower output growth. The interaction term is significant and negatively related to output growth. This result suggests that countries with universal banking that had banking crises experienced a slowdown in their economy.

The other variables still have the expected signs. In specifications (2) and (4), the real exchange rate and change in terms of trade are also included. Results show that a terms of trade improvement results in higher output growth. In specification (3), the effects of branching are explored again and branching increases output growth.[19]

4 Conclusion

This paper analyzes banking stability in the interwar period for several reasons. First, banking crises increased the severity and length of the Great Depression. Second, interwar banking crises have many common characteristics with recent crises, so a historical analysis

[19]In results not reported here, these regressions were repeated with random effects and the main results continue to hold.

might shed some light on the causes and consequences of banking crises today. Researchers have focused on several characteristics of banks such as branching, bank concentration and bank size, to pinpoint what causes financial instability. Calomiris and Gorton (1991) show that banking systems with high concentration and extensive branching networks have greater stability due to better diversification. This study focuses on another aspect of banking systems, whether they engaged in universal banking or not.

The studies on the role of universal banking in Europe have concentrated either only on case studies of individual banks or narrative evidence on the events surrounding the banking system as a whole. This paper contributes to this literature by examining quantitatively the relationship between universal banking and having a banking crisis. The results show that countries with universal banking were more likely to experience crises.

Furthermore, the role of the gold exchange standard in preventing central banks from helping the banking system is reconfirmed. A high discount rate, having a peg and lower reserves all increase the probability of a crisis. The fate of the banking system during a crisis is closely related to the exchange rate regime. In this period, central banks preferred to keep the exchange rate stable by increasing interest rates instead of helping the banking systems in need of liquidity. In any case, access to foreign capital had enabled banks to be independent of central banks. Only in times of crisis did they turn to the central bank to discount their bills, but the rules of the gold standard prevented central banks from acting as a lender of last resort.

The interwar years were characterized by low output and high unemployment. The effect of banking crises on output growth is also analyzed, contributing to the growing new empirical literature on the relationship between crises and output loss. Regression analysis shows that countries with universal banking that experienced crises experienced a slowdown in economic growth as measured by output performance.

These issues are important given recent reforms that have pushed banking systems to-

wards universality; e.g., the repeal of the Glass-Steagall Act in the U.S. Furthermore, research on recent crises in Asia have highlighted the important link between banks and firms in increasing financial instability. Examining interwar European experience gives new insight on different banking mechanisms and characteristics that play roles in the propagation of crises. A lot of new regulation came into effect to address these issues after the Great Depression, and reviewing these events can help us today when a new financial architecture is being discussed in response to the recent global crisis.

References

Bernanke, Ben and Harold James, "The Gold Standard, Deflation and Financial Crisis in the Great Depression: An International Comparison," in R. Glenn Hubbard, ed., *Financial Markets and Financial Crises*, Chicago: University of Chicago Press, 1991, pp. 33–68.

Bordo, Michael, "Some Historical Evidence 1870-1933 on the Impact and International Transmission of Financial Crises," April 1985. NBER Working Paper No. 1606.

___ , Barry Eichengreen, Daniela Klingebiel, and Soledad Maria Martinez-Peria, "Is the Crisis Problem Growing More Severe?," *Economic Policy*, 2001, *32*, 51–82.

Boyd, John, Sungkyu Kwak, and Bruce Smith, "The Real Output Losses Associated With Modern Banking Crises," *Journal of Money, Credit and Banking*, 2005, *327*.

Calomiris, Charles, "The Costs of Rejecting Universal Banking: American Finance in the German Mirror, 1870-1914," in Naomi Lamoreaux and D. Raff, eds., *Coordination and Information*, Chicago: University of Chicago Press, 1995, chapter 8, pp. 257–315.

___ and Gary Gorton, "The Origins of Banking Panics: Models, Facts, and Bank Regulations," in Glenn Hubbard, ed., *Financial Markets and Financial Crises*, 1991, pp. 109–74.

Dell'Ariccia, Giovanni, Enrica Detragiache, and Raghuram Rajan, "The Real Effect of Banking Crises," February 2005. IMF mimeo.

Demirgüç-Kunt, Aslı and Enrica Degatriache, "Banking Sector Fragility: A Multivariate Logit Approach," *World Bank Economic Review*, 2000, *14* (2), 287–307.

___ and Enrica Detragiache, "The Determinants of Banking Crises in Developing and Developed Countries," 1998. IMF Staff Papers No. 45.

___ , ___ , and Poonam Gupta, "Inside the Crisis: An Empirical Analysis of Banking Systems in Distress," *Journal of International Economics and Finance*, 2006, *25* (5), 702–718.

Eichengreen, Barry and Jeffrey Sachs, "Exchange Rates and Economic Recovery in the 1930s," *Journal of Economic History*, December 1985, *45*, 925–46.

Fohlin, Caroline, "Financial Intermediation, Investment and Industrial Development: Universal Banking in Germany and Italy From Unification to World War I." PhD dissertation, University of California Berkeley 1994.

Francke, Hans-Hermann and Michael Hudson, *Banking and Finance in West Germany*, New York: St. Martins Press, 1984.

Gaytan, Alejandro and Romain Rancière, "Banks, Liquidity Crises and Economic Growth," 2003. Unpublished manuscript.

Gerschenkron, Alexander, *Economic Backwardness in Historical Perspective*, Cambridge Mass.: Harvard University Press, 1962.

Goldsmith, Raymond, *Financial Structure and Development*, New Haven: Yale University Press, 1969.

Gourinchas, Pierre-Olivier, Oscar Landerretche, and Rodrigo Valdés, "Lending Booms: Latin America and the World," *Economia*, 2001, *1* (2), 47–100.

Grossman, Richard, "The Shoe That Didn't Drop: Explaining Banking Stability in the Great Depression," *Journal of Economic History*, September 1994, *54* (3), 654–83.

Gupta, Poonam, Deepak Mishra, and Ratna Sahay, "Output Response to Currency Crises," 2003. IMF Working Paper No. 03/320.

Hutchison, Michael and Ilan Noy, "How Bad Are Twins? Output Costs of Currency and Banking Crises," *Journal of Money, Credit and Banking*, August 2005, *37* (4).

Jonker, Joost and Jan Luiten Van Zanden, "Method in Madness? Banking Crises Between the Wars, an International Comparison," in C. Feinstein, ed., *Banking, Currency and Finance in Europe Between the Wars*, Oxford: Cambridge University Press, 1995, pp. 77–93.

Kaminsky, Graciela and Carmen Reinhart, "The Twin Crises: The Causes of Banking and Balance-of-Payments Problems," *American Economic Review*, 1999, *89* (3), 473–500.

King, Robert and Ross Levine, "Finance, Entrepreneurship and Growth: Theory and Evidence," *Journal of Monetary Economics*, 1993, *32* (3), 513–542.

Kroszner, Randall S. and Raghuram Rajan, "Is the Glass-Steagall Act Justified? A Study of the U.S. Experience with Universal Banking Before 1933," *American Economic Review*, September 1994, *84* (4), 810–833.

Levine, Ross, "Bank-Based or Market-Based Financial Systems: Which is Better?," *Journal of Financial Intermediation*, 2002, *11.*

___ , Norman Loayza, and Thorsten Beck, "Financial Intermediation and Growth: Causality and Causes," *Journal of Monetary Economics*, 2000, *46* (1), 31–77.

Loayza, Norman and Romain Rancière, "Financial Development, Financial Fragility and Growth," *Journal of Money, Credit and Banking*, June 2006.

McDill, Kathleen, "On the Causes, Costs and Persistence of Banking Crisis," 2000. Unpublished PhD Dissertation, UC Santa Cruz.

Mitchener, Kris, "Are Prudential Supervision and Regulation Pillars of Financial Stability? Evidence from the Great Depression," forthcoming.

Sachs, Jeffrey, Aaron Tornell, and Andres Velasco, "Financial Crises in Emerging Markets: Lessons from 1995," *Brookings Papers on Economic Activity*, 1996, pp. 147–98.

Saunders, Anthony and Ingo Walter, *Universal Banking in the United States: What Could We Gain? What Could We Lose?*, New York: Oxford University Press, 1994.

Schubert, Aurel, *The Credit Anstalt Crisis of 1931*, Cambridge: Cambridge University Press, 1991.

Schumpeter, Joseph, *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, New York: McGraw-Hill, 1939.

Whale, P. Barret, *Joint Stock Banking in Germany*, London: Macmillan, 1930.

Wheelock, David, "Regulation and Bank Failures: New Evidence from the Agricultural Collapse of the 1920's," *Journal of Economic History*, December 1992, *52* (4).

White, Eugene, "Before the Glass-Steagall Act: An Analysis of the Investment Banking Activities of National Banks," *Explorations in Economic History*, 1986, *23*, 33–55.

Table 1: Banking Legislation

Country	**Banking Law**	**Amended to**
Belgium	November-35	
Czechoslovakia	April-32	
Denmark	April-30	
Finland	March-33	
Germany	December-34	
Greece	July-31	1921
Italy	March-36	1926
Norway	April-35	1924
Poland	March-28	
Portugal	March-25	
Romania	May-34	
Spain	December-27	
Sweden	March-36	1911, 1924
Switzerland	November-34	

Source: League of Nations, Money and Banking (1937).

Table 2: Differences in Banking Regulation Across Countries

	Minimum Capital	**Liquid Reserves**	**Own Funds/Credit**
Czechoslovakia			10
Denmark	10	15	35
Finland	10	20	
Germany	20		
Greece			20
Italy			20
Norway	10	20	25
Poland	10		10
Portugal		80	10
Romania	10	33	10
Sweden	12.5	25	
Switzerland	5	25	

Notes: The first column is the minimum capital requirements in %, the second column is the minimum ratio of cash to assets in % and the final column is the maximum ratio of a bank's own funds to total credits to a single debtor in %.

Table 3: Summary Statistics: Crisis vs. Non-Crisis Countries

Variable		Obs.	Mean	St.Dev	t-test
Peg	*No Crisis*	253	0.249	0.433	**-2.951**
	Crisis	20	0.550	0.510	
No of Months on Gold St.	*No Crisis*	314	4.659	5.765	**-2.216**
	Crisis	29	7.138	5.761	
Discount Rate	*No Crisis*	1803	5.245	3.194	1.334
	Crisis	94	4.797	2.682	
Foreign Exchange Reserves	*No Crisis*	1212	20.812	62.650	0.064
	Crisis	75	20.342	45.599	
Foreign Coverage	*No Crisis*	147	51.763	22.064	**4.784**
	Crisis	21	28.010	14.374	
Capital Controls	*No Crisis*	291	0.320	0.467	1.561
	Crisis	24	0.167	0.381	
Stock Market Index	*No Crisis*	1508	109.908	51.544	**2.895**
	Crisis	36	84.806	45.987	
Note Circulation	*No Crisis*	1921	29.692	105.340	**-2.023**
	Crisis	94	52.566	137.302	
New Firms	*No Crisis*	195	138.154	106.970	**3.861**
	Crisis	21	47.810	8.981	
Bankruptcies	*No Crisis*	1065	201.834	282.242	**-4.696**
	Crisis	70	374.286	475.675	
Unemployment	*No Crisis*	808	19.690	43.870	-1.541
	Crisis	57	29.170	57.730	
Industrial Production	*No Crisis*	195	99.692	21.778	**2.324**
	Crisis	21	88.448	12.232	
Real GDP Growth	*No Crisis*	252	4.049	8.735	1.615
	Crisis	21	0.886	7.053	
Money/Reserves	*No Crisis*	198	12.710	16.371	0.619
	Crisis	19	10.352	8.432	
Discount Rate	*No Crisis*	235	4.975	1.914	0.113
	Crisis	25	4.929	2.081	
Loans to Industry	*No Crisis*	161	48.663	27.096	-0.532
	Crisis	21	52.062	30.963	
Universality	*No Crisis*	2266	0.883	0.795	**-7.356**
	Crisis	110	1.445	0.499	
Bank Reform in the 1920s	*No Crisis*	2266	0.191	0.393	**5.088**
	Crisis	110	0.000	0.000	

Notes: t-statistics reported for two-sided null hypothesis of no difference between crisis and no-crisis. Bold ones represent a rejection of the null hypothesis. *Source*: International Abstract of Economic Statistics, 1919-1930, and 1931-1937.

Table 4: Determinants of Crises: Logit Regressions Using Monthly Data: 1920-1936

	(1)		(2)		(3)	
	Estimates	Marg Eff	Estimates	Marg Eff	Estimates	Marg Eff
Universal	2.941***	0.159	2.755***	0.151	3.006***	0.168
	(0.530)		(0.563)		(0.571)	
Change in Disc. Rate	1.049	0.057	0.074	0.045	0.210	0.006
	(1.497)		(1.703)		(1.497)	
Note Circulation Gr.	0.153	0.005	-0.035	-0.001	-0.017	-0.001
	(0.624)		(0.669)		(0.668)	
Inflation	-3.115	-0.120	-2.561	-0.120	-6.132	-0.186
	(4.513)		(4.391)		(4.978)	
Bankruptcies	0.004***	0.000	0.003***	0.000	0.001	0.000
	(0.001)		(0.001)		(0.001)	
For. Reserves			-0.001**	0.000		
			(0.000)			
CB Discounts			-0.498	0.023		
			(0.586)			
Bankruptcy*Univ					0.002**	0.000
					(0.001)	
Constant	-5.260***		-5.071***		-5.234***	
	(0.518)		(0.555)		(0.555)	
Observations	1012		887		864	
Log-likelihood:	-220.90		-215.58		-176.02	
pseudo-R^2:	0.13		0.12		0.17	

Notes: This table gives logit estimates and the corresponding marginal effects of financial structure on having a banking crisis, after controlling for other banking and macroeconomic conditions. The dependent variable is equal to 1 if the country experiences a banking crisis and 0 otherwise. The explanatory variables are lagged one period. Standard errors in parentheses,* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Determinants of Crises: Logit Regressions Using Annual Data: 1924-1938

	(1)		(2)		(3)	
	Estimates	Marg Eff	Estimates	Marg Eff	Estimates	Marg Eff
Universal	1.691*	0.119	1.964**	0.119	1.603	
	(0.876)		(0.921)		(1.150)	
Change in Disc Rate	-1.306	-0.102	1.201	0.081	1.610	0.078
	(2.306)		(2.729)		(3.679)	
Foreign Reserves	-0.185	-0.014	-0.303	-0.020	-0.281	-0.013
	(0.317)		(0.395)		(0.546)	
Peg	1.239*	0.101	1.089	0.076	0.483	0.024
	(0.670)		(0.697)		(0.984)	
CB Independence	-1.329*	-0.108	-1.465**	-0.105	-1.753*	-0.124
	(0.689)		(0.733)		(0.938)	
Branch	-1.363*	-0.128	-1.604**	-0.137	-2.815**	-0.159
	(0.749)		(0.789)		(1.275)	
1931 Dummy			2.073**	0.278		
			(0.939)			
Capital Controls					-0.661	-0.032
					(1.071)	
Constant	-2.545***		-2.676***		-1.444	
	(0.711)		(0.722)		(1.132)	
Observations	116		116		80	
Log-likelihood:	-37.01		-34.54		-20.74	
pseudo-R^2:	0.13		0.19		0.20	

Notes: This table gives logit estimates and the corresponding marginal effects of financial structure on having a banking crisis, after controlling for other banking and macroeconomic conditions. The dependent variable is equal to 1 if the country experiences a banking crisis and 0 otherwise. The explanatory variables are lagged one period. Standard errors in parentheses,* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Consequences of Crises

	(1)	(2)
Universal	0.109**	0.121**
	(0.050)	(0.057)
Discount Rate	-1.685***	-1.568**
	(0.593)	(0.648)
Reserves	0.111**	0.123**
	(0.050)	(0.057)
Peg	-1.248	-1.252
	(1.673)	(1.769)
Trade Openness	0.003	0.003
	(0.003)	(0.003)
Capital Controls	-3.683*	-3.536
	(2.026)	(2.293)
CB Independence	1.342	0.766
	(1.841)	(2.166)
Branch		0.830
		(1.970)
1931 Dummy	-9.204**	-9.240**
	(3.590)	(3.691)
Constant	11.164***	10.394***
	(3.107)	(3.573)
Observations	61	59
R-squared	0.22	0.22

Notes: Estimated using OLS with White's correction for heteroscedasticity. The dependent variable is real GDP growth. The sample period: 1924-1938. All the explanatory variables are lagged one period. Standard errors in parentheses,* significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: Consequences of Crises: Interaction Terms

	(1)	(2)	(3)	(4)
Universal	2.644**	2.659**	2.341*	4.162**
	(1.269)	(1.240)	(1.295)	(1.989)
Crisis	-2.479	-2.874	-2.794	-7.381**
	(1.799)	(1.766)	(1.819)	(3.105)
Univ*Crisis	-13.704***	-13.844***	-14.142***	-17.217***
	(2.871)	(2.806)	(2.894)	(3.645)
Ch. in Disc.Rate	-6.435*	-7.674**	-6.586*	-8.595
	(3.718)	(3.693)	(3.715)	(5.470)
Peg	-1.305	-2.136*	-1.928*	-2.690
	(1.155)	(1.169)	(1.140)	(1.987)
Capital Controls	-1.712	-1.450	-1.998*	-0.824
	(1.098)	(1.085)	(1.165)	(1.899)
CB Independence	0.243	0.004	0.330	1.944
	(0.996)	(0.985)	(1.005)	(2.367)
Change in ToT				-0.426**
				(0.178)
Exchange Rate		-0.012**		
		(0.005)		
Branch			1.124	
			(0.998)	
Constant	4.737***	5.478***	5.602***	4.987***
	(1.137)	(1.155)	(1.371)	(1.548)
Observations	105	105	105	33
R-squared	0.24	0.28	0.25	0.66

Notes: Estimated using OLS with White's correction for heteroscedasticity. The dependent variable is real GDP growth. The sample period: 1924-1938. All the explanatory variables are lagged one period. Standard errors in parentheses,* significant at 10%; ** significant at 5%; *** significant at 1%.

A Appendix: Countries in the sample

Annual Data	**Monthly Data**
Austria	Austria
Belgium	Belgium
Czechoslovakia	Czechoslovakia
Denmark	France
Estonia	Germany
Finland	Hungary
France	Italy
Germany	Netherlands
Greece	Norway
Hungary	Poland
Italy	Spain
Latvia	Sweden
Netherlands	Switzerland
Norway	United Kingdom
Poland	
Portugal	
Romania	
Spain	
Sweden	
Switzerland	
United Kingdom	